



Flash Flood Risk Analysis Project

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National Weather Service

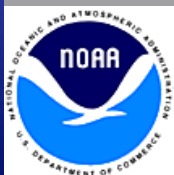
Springfield, Missouri





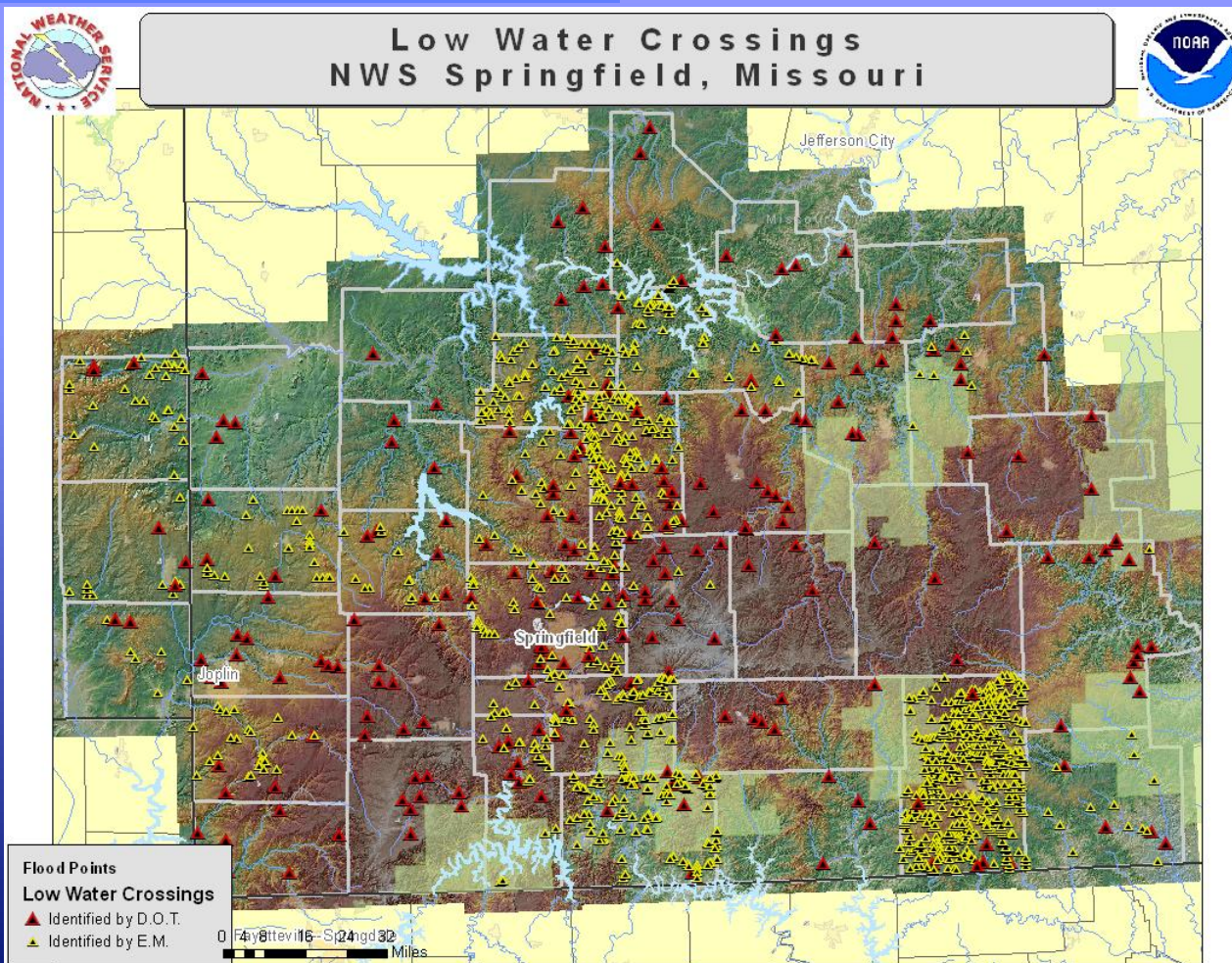
Flooding in the Ozarks

- Flash flooding is the #1 weather killer in the Ozarks
- The threat is compounded by thousands of low water crossings.



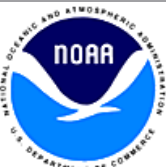
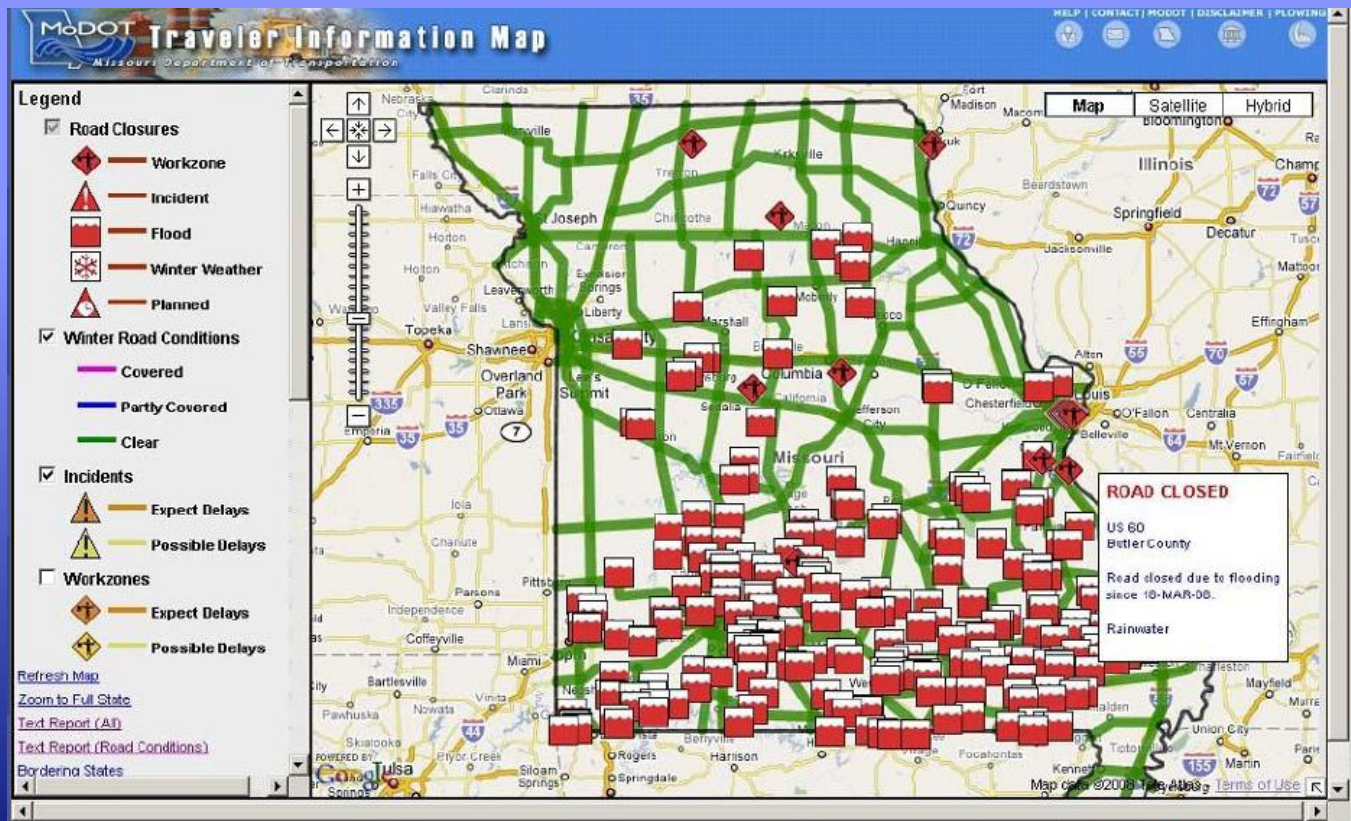


Flooding in the Ozarks



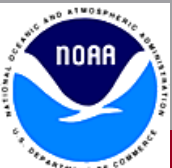


Flooding in the Ozarks



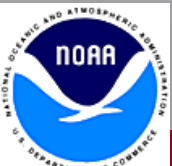


Flooding in the Ozarks



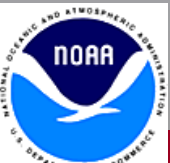


Flooding in the Ozarks





Flooding in the Ozarks

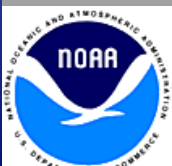




FFRAP Partnership

Partnership Building

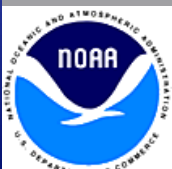
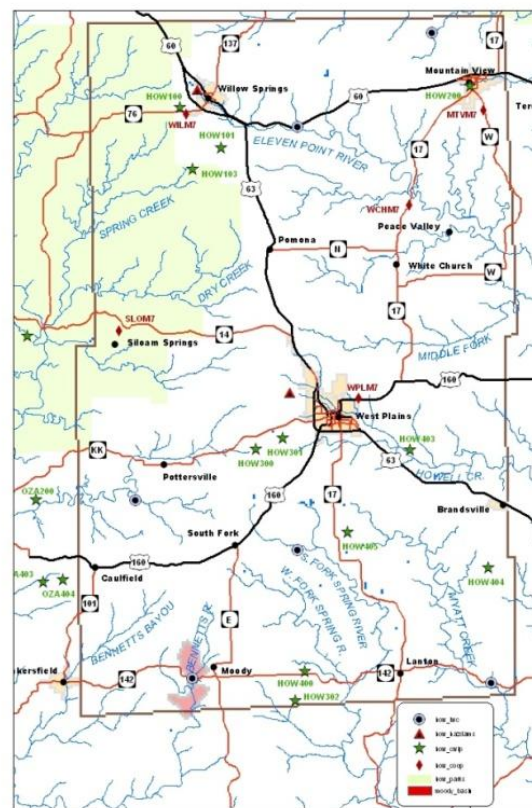
- SW MO Council of Governments
- Missouri State University
- Emergency Management
- Media
- Skywarn
- MODOT/KDOT
- Missouri Highway Patrol
- NCAR





FFRAP Goals

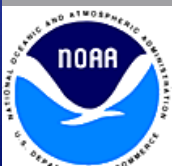
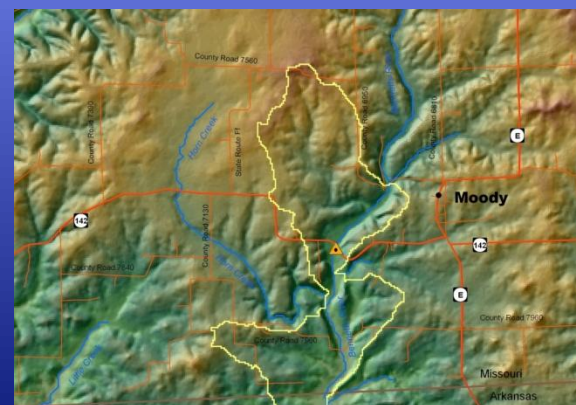
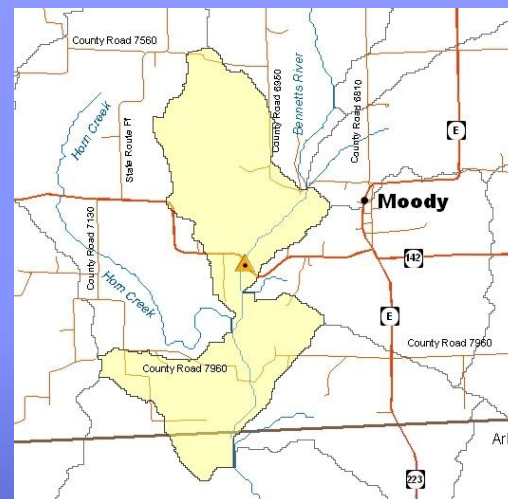
- Development of GIS enhanced Flash Flood Analysis
- Identify flood behavior factors
- Categorize flood risk rating per basins, streams, communities, etc.
- Develop GIS utilities that integrate this data into the warning process.





FFRAP Goals

- Provide emergency management w/ data to assess local flood threats
- Create GIS enhanced flash flood warnings for the general public
- Detailed flood risk information for specific basins, streams, or communities.





FFRAP Process

Physical Characteristics

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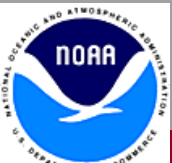
Socio-Economic Characteristics

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Meteorology

=

More Valuable Flash Flood Warnings

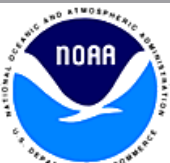
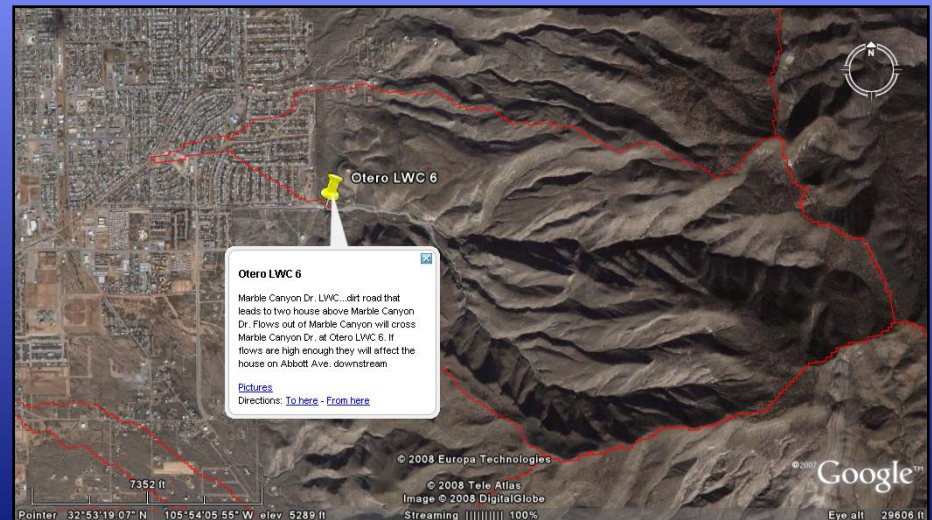




FFRAP Process

Physical Characteristics

- Basin geography & steepness
- Soil characteristics & conditions
- Vegetation & forest coverage
- Land use

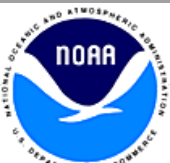
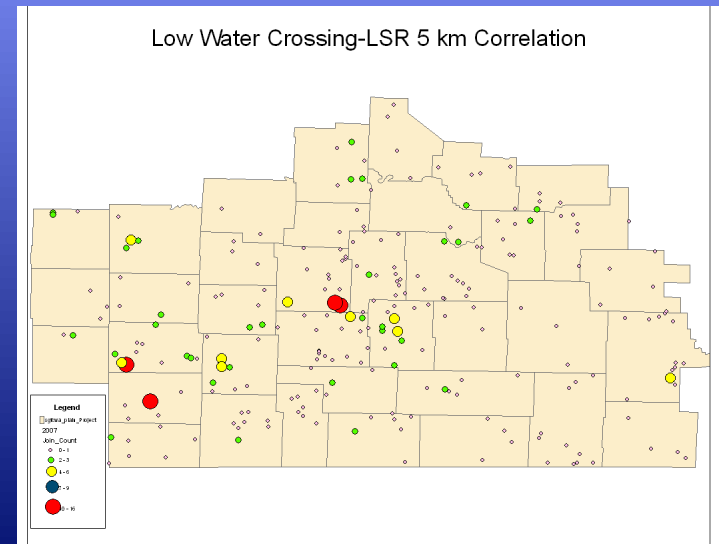




FFRAP Process

Socio-Economic Characteristics

- Rate of travel on impacted roads
- Rate of flood occurrence
- Water rescue frequency
- Population Density

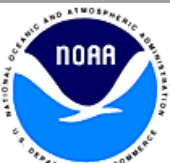
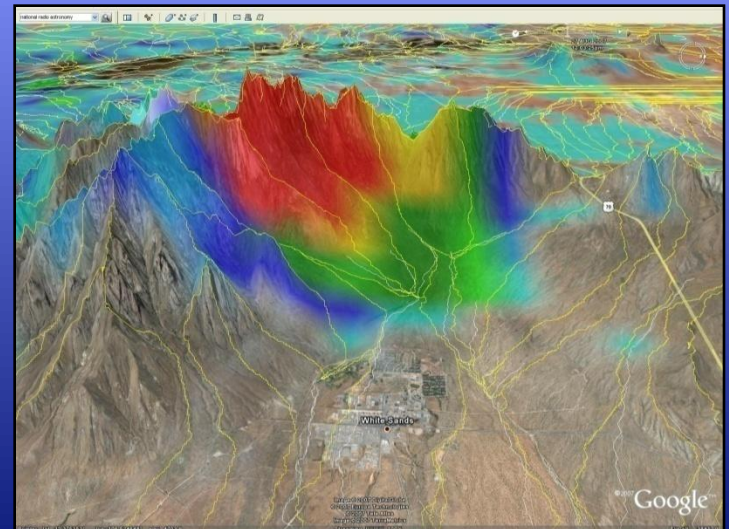
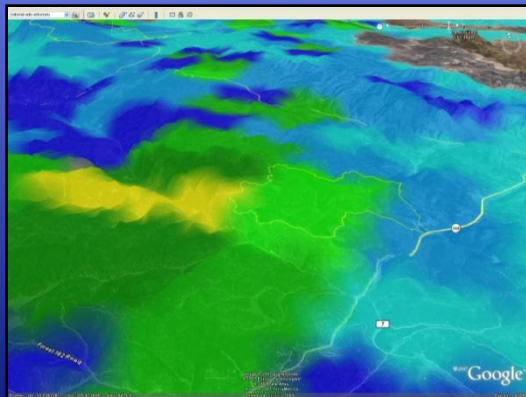




FFRAP Process

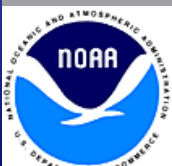
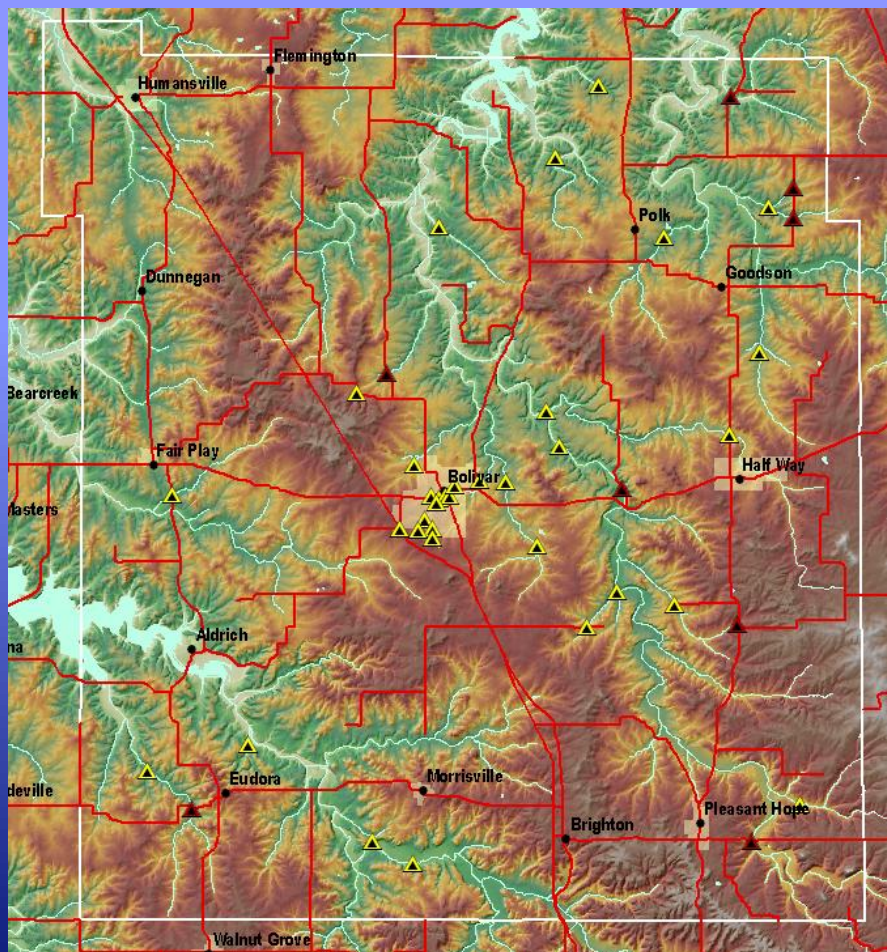
Meteorology

- Rainfall rates
- Rainfall duration
- Total rainfall amounts
- Saturation



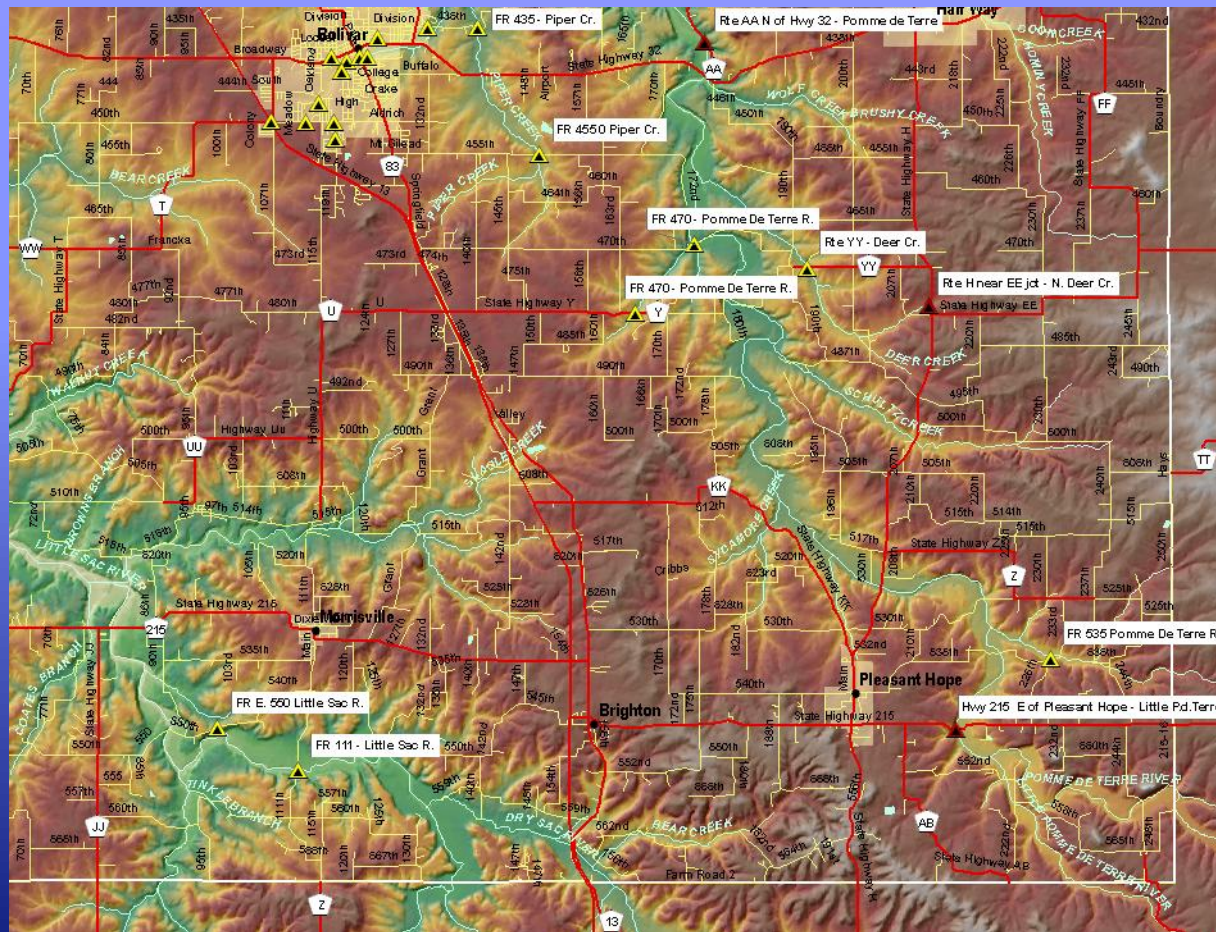


FFRAP GIS Analysis



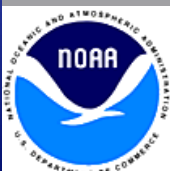
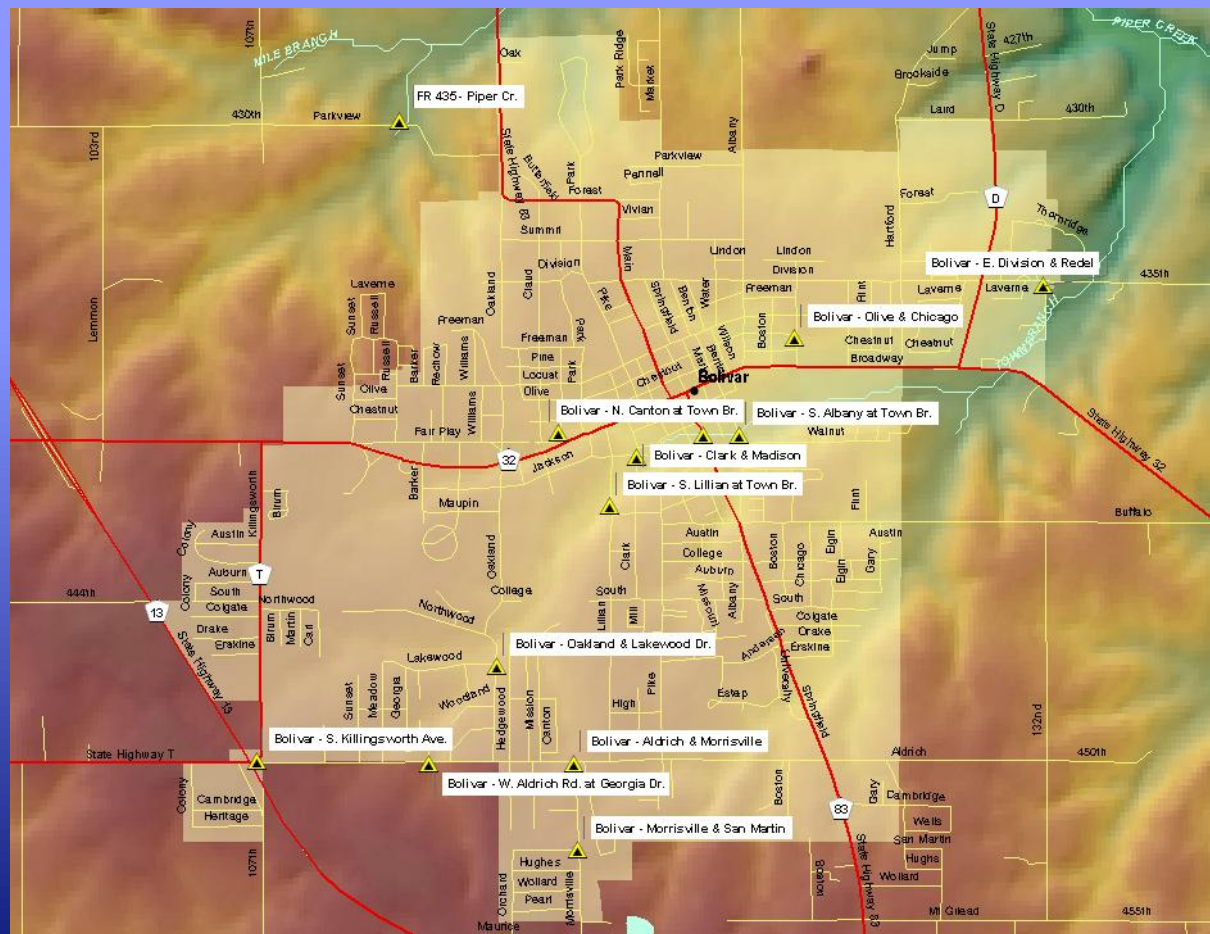


FFRAP GIS Analysis





FFRAP GIS Analysis

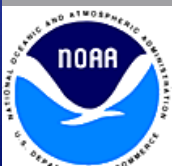
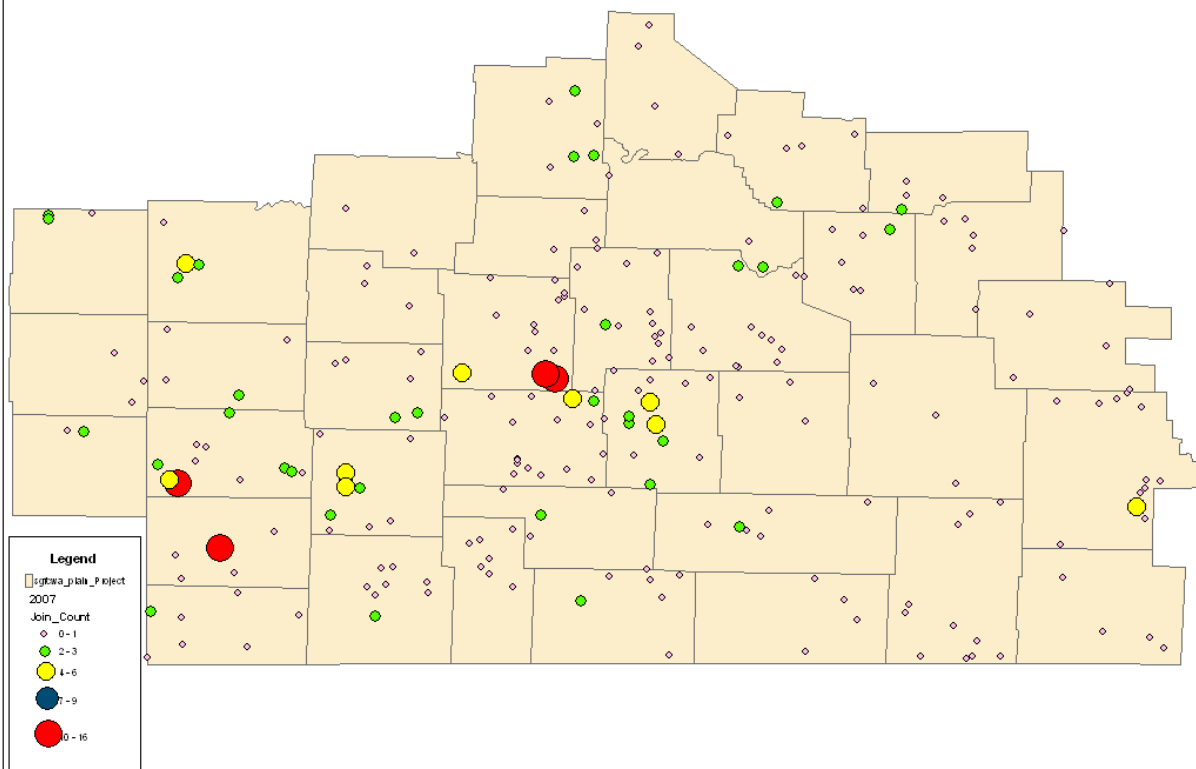




FFRAP GIS Risk Analysis

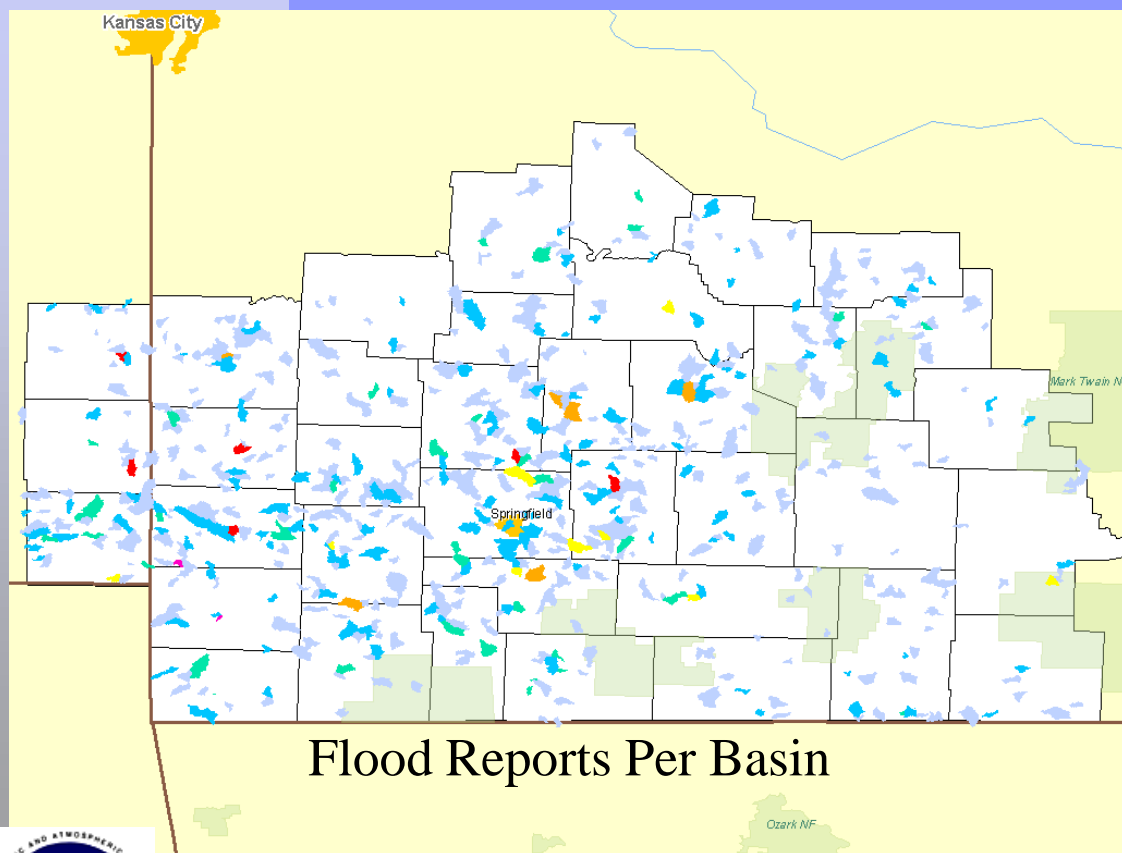
Spatial Analysis Tools allow us to correlate number of flood reports, fatalities, injuries and water rescues for a given low water crossing

Low Water Crossing-LSR 5 km Correlation

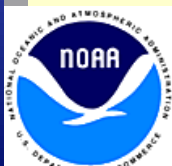




FFRAP GIS Risk Analysis

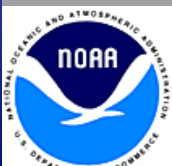
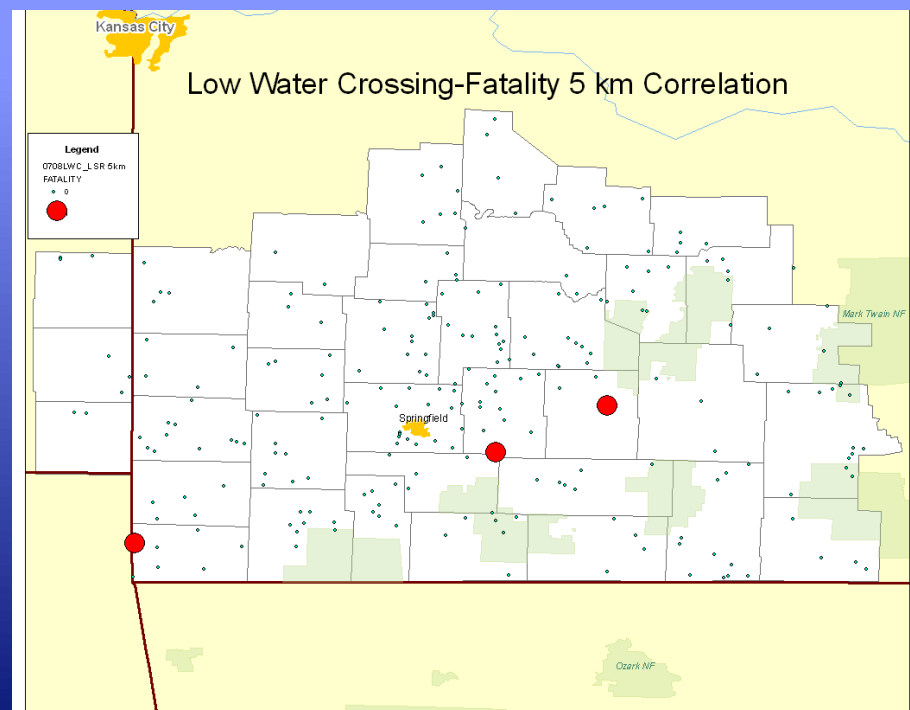
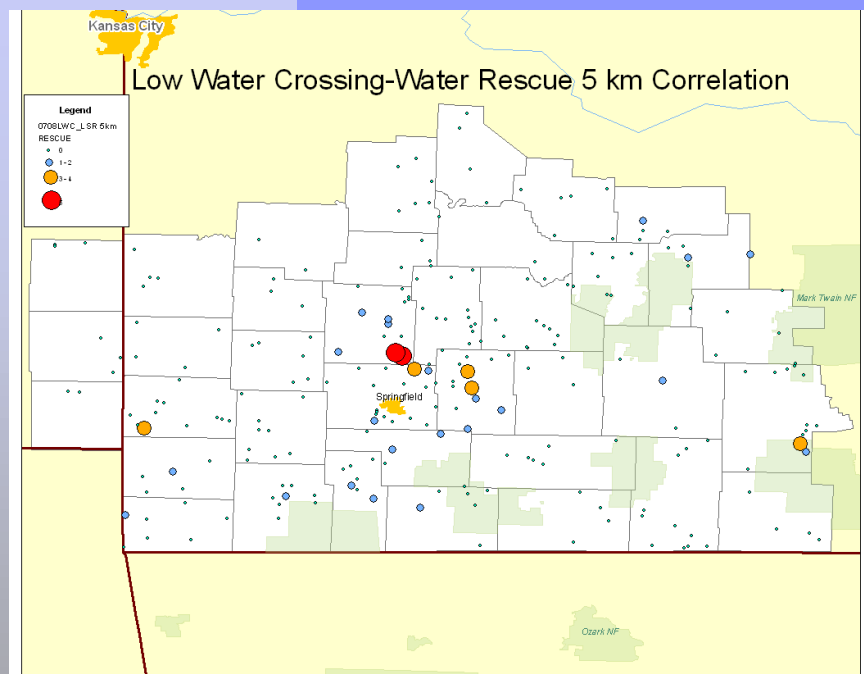


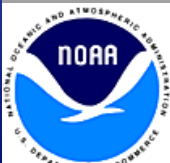
Spatial Analysis
Tools also allow us to correlate number of flood reports, fatalities, injuries and water rescues across warning basins





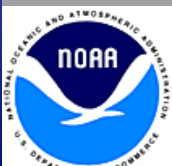
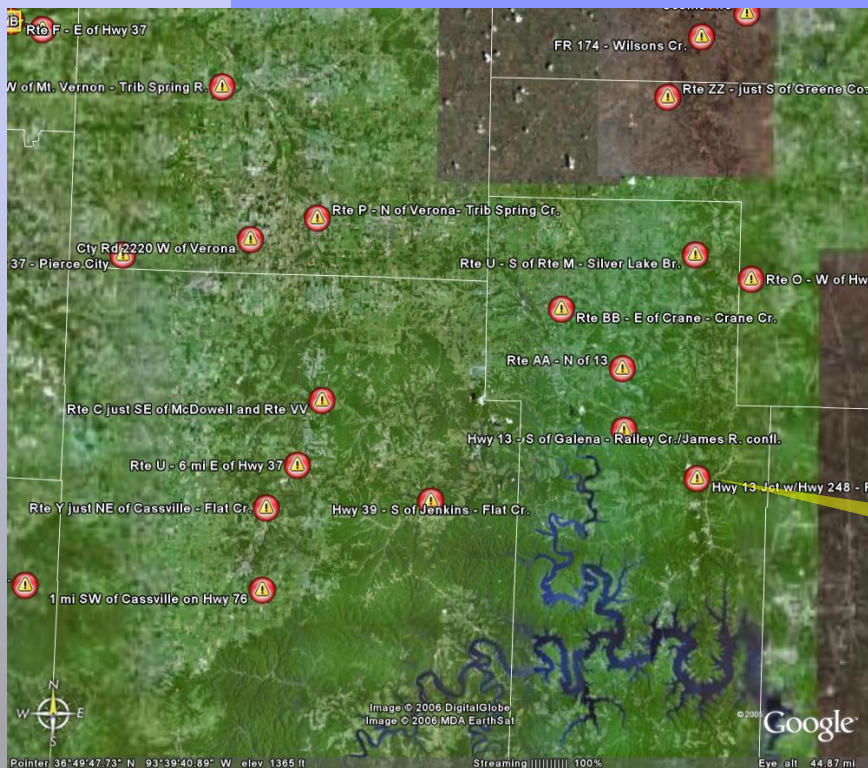
FFRAP GIS Risk Analysis





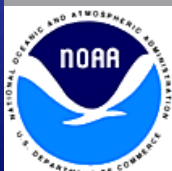
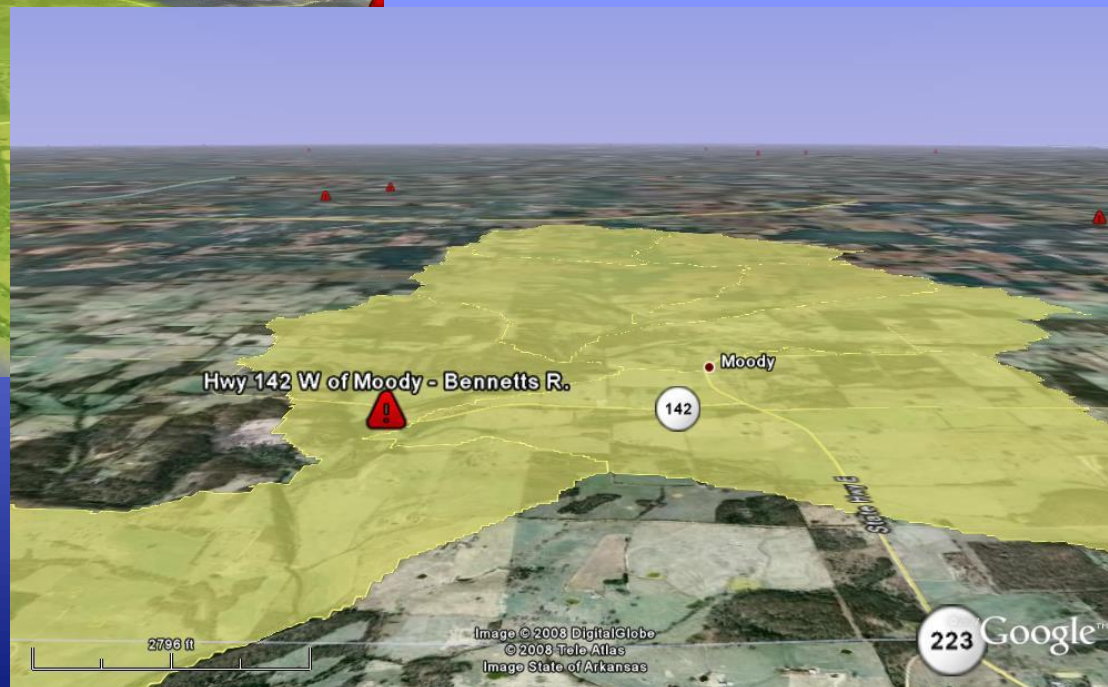
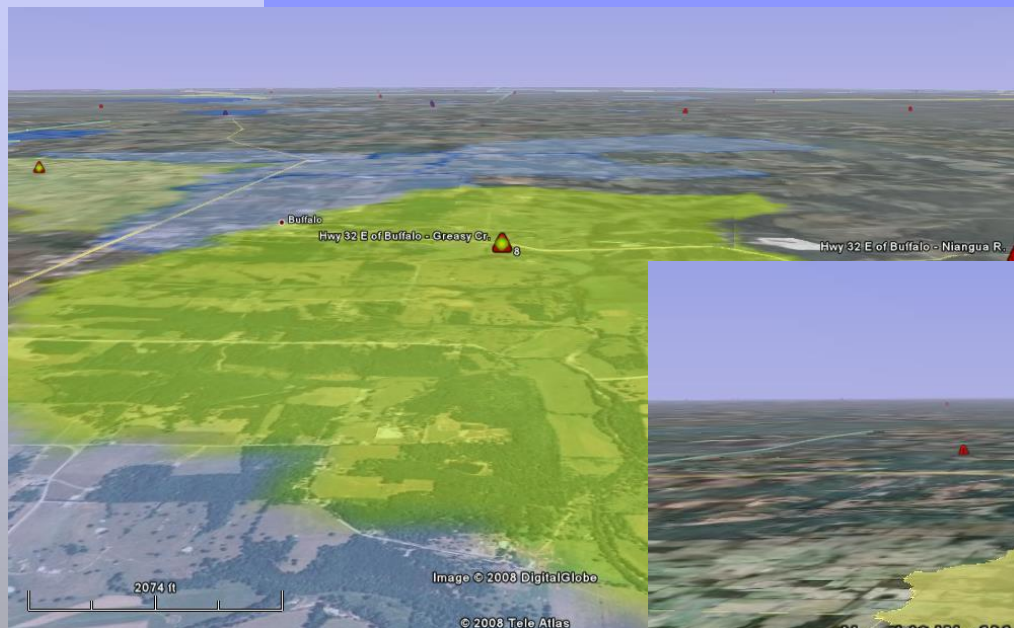


FFRAP Visualization



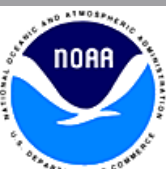
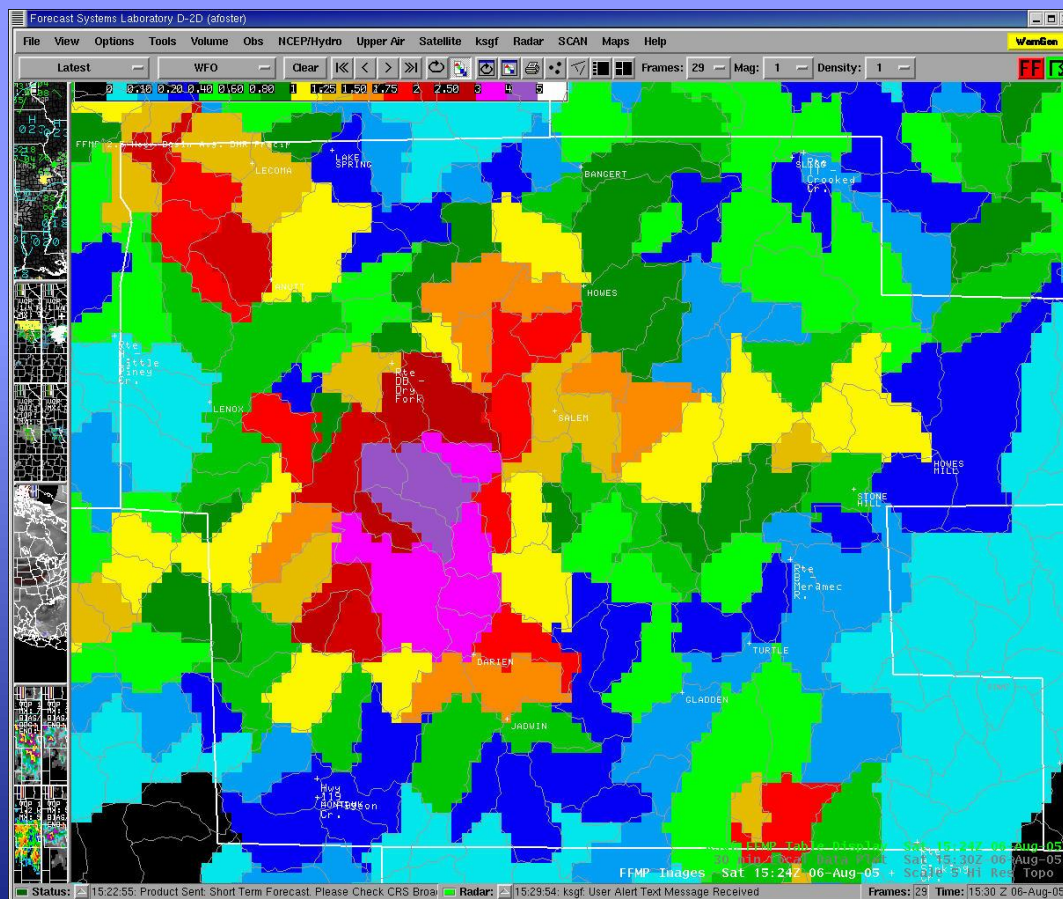


FFRAPAP Visualization



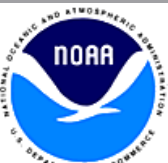
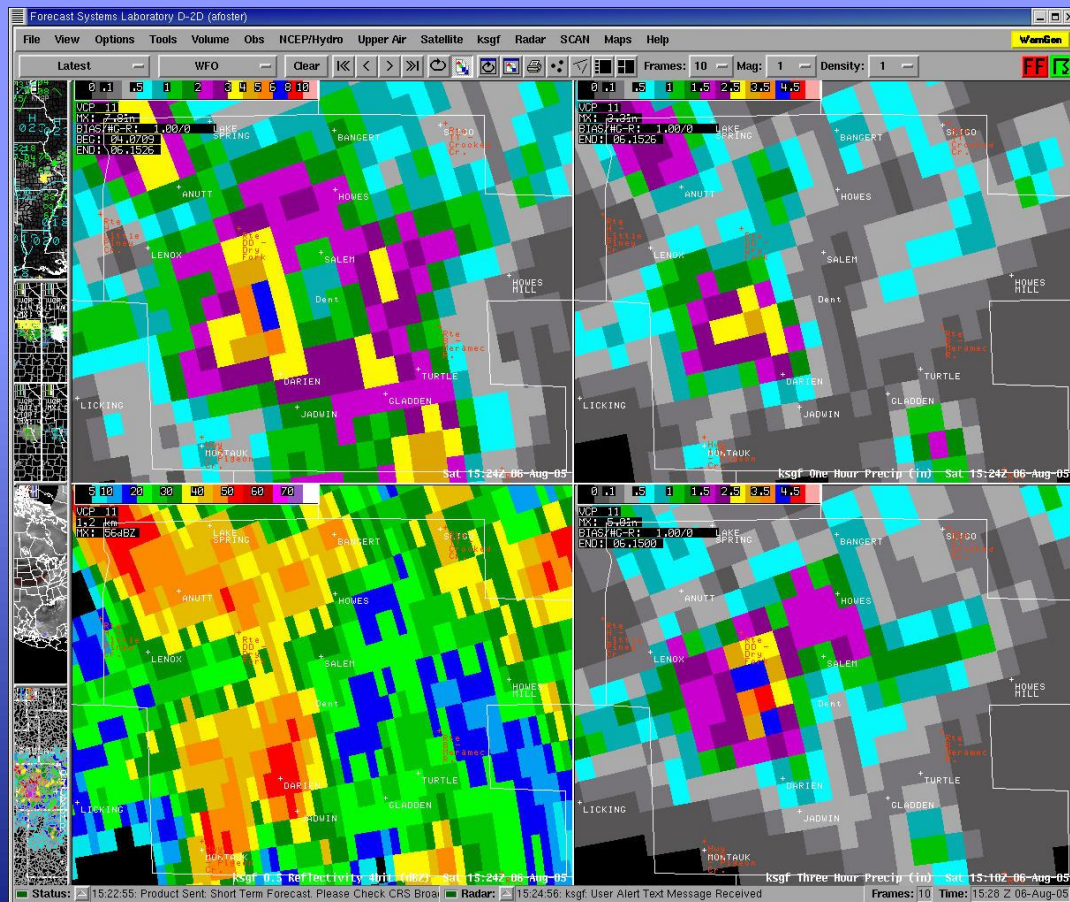


FFRAP Operational Tools





FFRAP Operational Tools





FFRAP on the WEB

NOAA National Weather Service Weather Forecast Office
Springfield, MO

Local forecast for "City, ST" or Zip Code

Current Weather: Watches / Warnings / Outlooks / U.S. Records / Hurricane Info / Spelling / Learning / Equinox / Dextro / Pages / NOAA Watch / Current Conditions / Observations / Satellite Images / Rivers & Lakes Alerts / Flash Estimate / Snow Cover / Local Levels / Radar Imagery / Local Radar / Hailwatches / KML / Forecasts / Activity Planner / Aviation / Fire Weather / Organized / Forecast Discussion / Meteorological Guidance / River / Hydrology / APTS / River Info / Flood Briefing / Hydro Page / Climate / Local / National / Marine / Severe Weather / Monthly Summaries / CDO/OWS / Weather Safety / Stormready / Preparedness / Weather Radio / EMER / Emergency Management / Hazard Risk / Assessment / Local Information / Our Office / Chief Observer / CWP Program / Office History / Newsletter / Web Site Products / Event Resources / Technical Papers / News Story Archive / Services / EAS / PWS / GIS Info / Seasonal / Severe Briefing / Heat Briefing / Recreational Weather / Road Conditions / Mesoscale / Weather Photos / Education / Contact Us / Webmaster / Feedback

Low Water Crossings

Turn Around Don't Drown

Map | Warnings | Safety

Flooded low water crossings pose a serious threat to life in the Ozarks. Hundreds if not thousands of low water crossings dot the landscape of the Ozarks and are routinely traveled by many. Recent flood events have demonstrated the dangers of low water crossings with numerous water rescues. To locate and better understand flood prone areas, NWS Springfield has developed the Flash Flood Risk Analysis Project.

For current state road closures due to flooding visit the Missouri Department of Transportation & Kansas Department of Transportation web sites.

**FLOODING AHEAD
TURN AROUND
DON'T DROWN**

Low Water Crossing Map

These flood points consist of low water crossings, low lying areas, streams, and other flood prone areas. The flood points represent the general location of the flood risk. The frequency or characteristics of the flooding at a given point is not represented. For a closer look at low water crossings in your area select a county from the list below.

Select a county for a closer look
Select a County

Thanks to the Emergency Management Community, MODOT, and NDOT for their cooperation in identifying these flood prone locations.

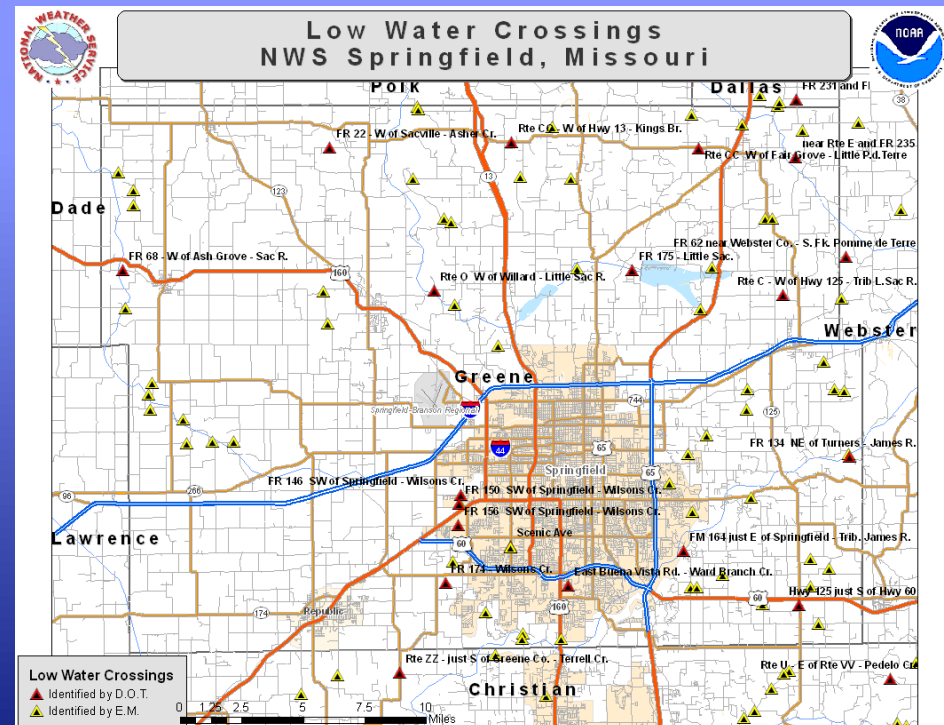
Flash Flood Warning and Information

- Flash Flood Briefing Page - Monitor the flooding potential and current warnings.
- Advanced Hydrologic Service Page - Monitor river stages and forecasts.

Safety

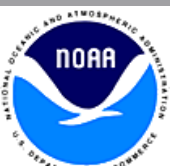
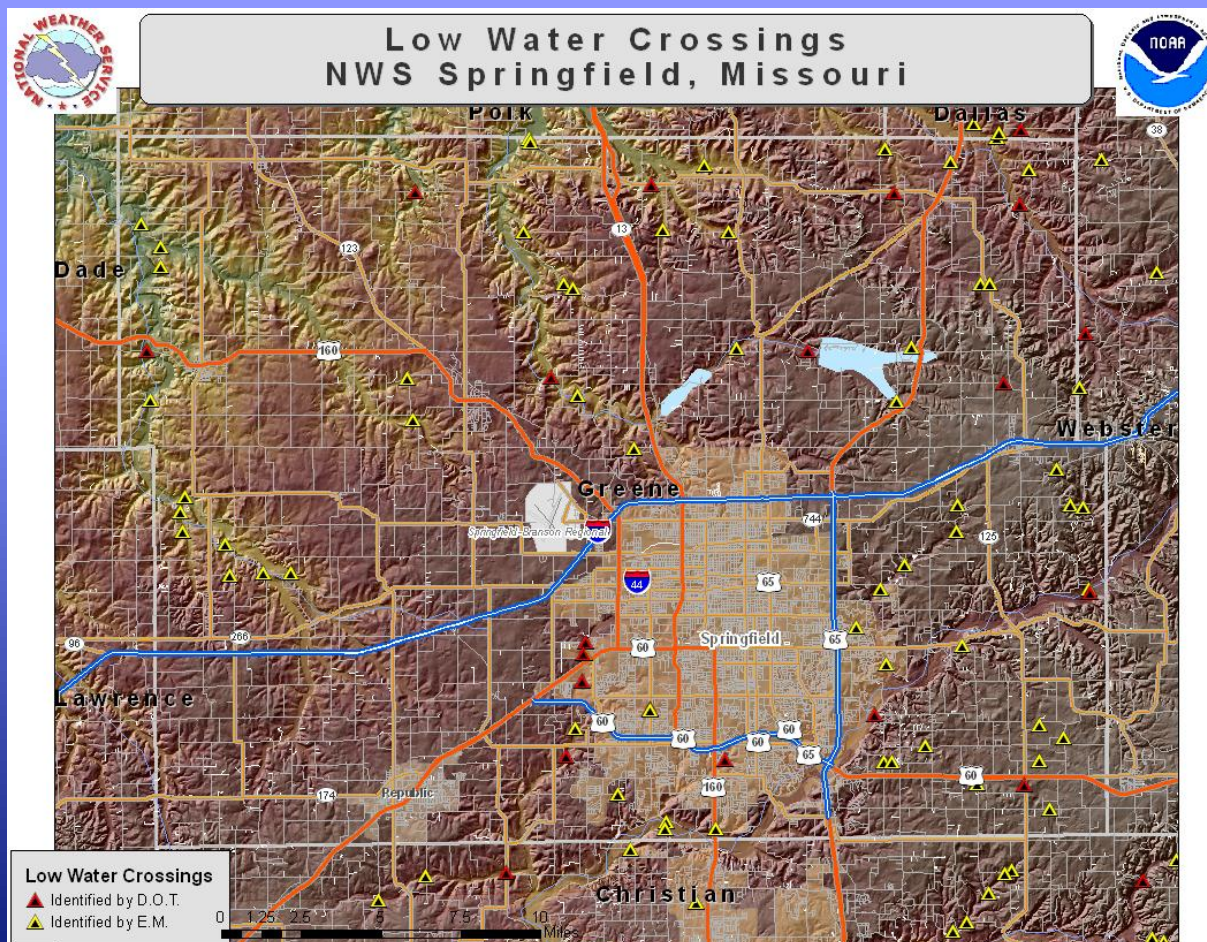
- Turn Around Don't Drown
- NWS Flood Safety

www.weather.gov/sgf/?n=lowwatercrossing





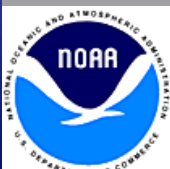
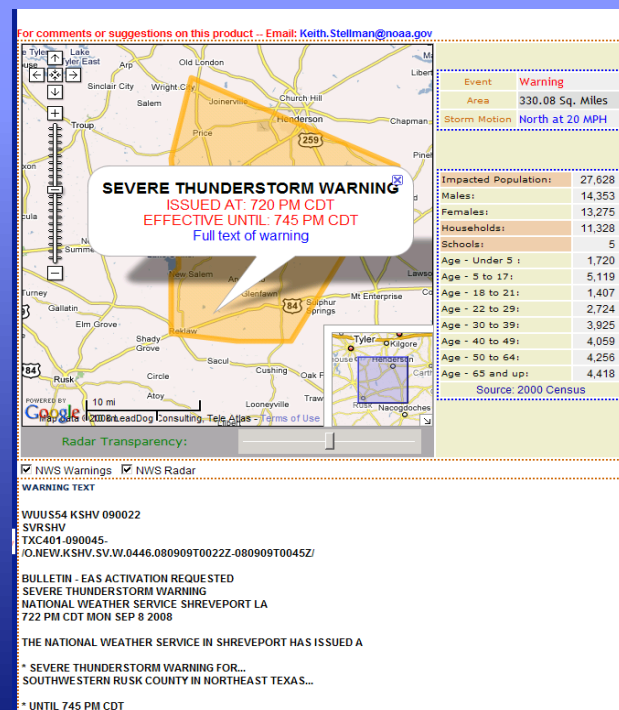
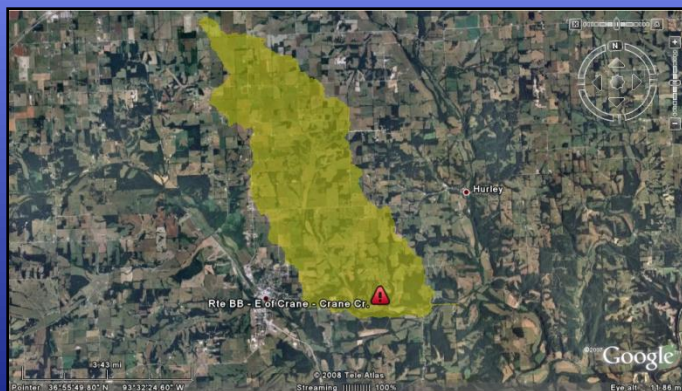
FFRAP on the WEB





The Future

- Development of GIS enhanced Flash Flood Analysis
- Development of GIS Flash Flood Warnings
- Research and Development
- Incorporate Societal Impacts
- Safety Campaigns





The Future

Partner Building!





Contact Information

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<http://www.crh.noaa.gov/sgf/?n=lowwatercrossings>

http://www.crh.noaa.gov/sgf/?n=FFRAP_index

<http://www.crh.noaa.gov/sgf/?n=ffrapsymposium>

